

Serial No. 09/865,994

# AMENDMENTS TO THE SPECIFICATIONS

## V. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, where the present invention is generally referred to with numeral 10, it can be observed that it basically includes housing 20, wound conduit assembly 40, inlet 44 and outlet 46. In operation, a fluid to be processed (typically containing small particles or vaporized liquids in suspension) enters inlet 44 and exits through outlet 46. One of the advantages of this invention is that it lends itself to be used in a continuous system, such as for treating the exhaust gases produced by an internal combustion engine.

As seen in figure 1, housing 20 has a substantial cylindrical shape with a concave bottom 22 including an opening 23 in its lowermost point. Wound conduit assembly 40 is mounted inside housing 20.

Wound conduit assembly 40 includes a serpentine conduit member 42 with outermost wall portion 43. Serpentine conduit member includes inlet 44 and outlet 46. Outermost wall portion 43 has a plurality of through openings 47. In the preferred embodiment, openings 47 are formed at an angle to facilitate the exit of the heavier matter contained in the gas mixture, as best seen in figure 2. Inwardly extending portion 48 directs particles that pushed outwardly by the centrifugal force to enter opening 47.

The present invention can be implemented with different means for applying a pressure differential between inlet 44 and outlet 46 so that the fluid entering inlet 44 is forced through serpentine conduit member 42 and

*Serial No. 09/865,994*

1 out through outlet 46. The heavier matter contained in the fluid is forced  
2 radially out through openings 47 by the action of the centrifugal forces. In  
3 this manner, the resultant fluid that exits through outlet 46 is free of the  
4 heavier particles and/or liquids. The pressure differential can be enhanced  
5 with the application of a pressurized second fluid (such as air) through  
6 inlet 44 that causes the fluid being processed to speed up through member  
7 42.

8  
9 The centrifugal force acting on the solids or heavier mater suspended  
10 in the fluid is represented with the following equation  $F = V^2/R$  where V is  
11 the velocity of the fluid and suspended heavier matter and R is the radius  
12 of curvature.

13  
14 In the embodiment shown in figure 1, the heavier matter passing  
15 through openings 47 is collected at bottom 22 passed through 23 for  
16 disposal or further processing.

17  
18 One of the applications for the present invention is with internal  
19 combustion engines. The exhaust gases typically contain particles and oil  
20 vapors in suspension. Other industrial applications make also desirable  
21 separating solids/liquids from fluids (liquids or gases), such as  
22 environmental, pollution control devices and others. Forcing the exhaust  
23 gases through serpentine conduit member 42 causes a centrifugal force that  
24 is proportional to the square of the to rotational speed at which the exhaust  
25 gases are traveling. The higher the pressure differential with respect to  
26 outlet 46, the faster the gases will travel and the higher the magnitude of

*Serial No. 09/865,994*

1 the centrifugal force. Also, the larger the radius of curvature of the wound  
2 conduit members, the smaller the centrifugal force.

3  
4 Applicant has found that using a coil of 6.4 cm. in diameter for the  
5 wound conduit member and with a conduit member having an inner  
6 diameter of 1 cm., the pressure provided by typical internal combustion  
7 engines has been sufficient to impart the necessary speed to the fluid for  
8 the present invention to work.

9  
10 Another application would be the use of the invention in polluted  
11 areas such as industrial smokestacks. In these applications, the polluted air  
12 can be compressed and injected to inlet 44 or alternatively a negative  
13 pressure is applied to outlet 46 to suck the polluted air.

14  
15 One other possible application contemplates the use of the invention  
16 with pressurized gases, such as air, to separate water vapors and other  
17 particles.

18  
19 Still another application involves a liquid fluid, such as oil, with  
20 small solids in suspension. The oil can be engine in transmission oil, for  
21 instance. The liquid is forced through inlet 44 in a similar fashion as  
22 discussed above.

23  
24 The foregoing description conveys the best understanding of the  
25 objectives and advantages of the present invention. Different embodiments  
26 may be made of the inventive concept of this invention. It is to be  
27 understood that all matter disclosed herein is to be interpreted merely as  
28 illustrative, and not in a limiting sense.